ORIGINAL

BEFORE THE

Federal Communications Commission

WASHINGTON, D.C.

In re:	)	
	)	GN Docket No. 96-228
Amendment of the Commission's Rules to	)	
Establish Part 27, the Wireless	)	DOCKET FILE COPY ORIGINAL
Communications Service ("WCS")	)	

To: The Commission

COMMENTS OF DIGIVOX CORPORATION

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December 4, 1996

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Summary

DigiVox Corporation hereby urges the Federal Communications Commission (the "Commission") to adopt the following proposals in auctioning spectrum in the 2305-2320 and 2345-2360 MHz bands for use in providing Wireless Communications Service ("WCS").

First, DigiVox proposes that the Commission allocate the 2305-2320 and 2345-2360 MHz bands by providing 10 MHz to each WCS licensee in paired blocks of 5 MHz. DigiVox additionally proposes that the Commission license WCS spectrum based on the MTA license service area. DigiVox further proposes an auction schedule that the Commission should adopt for the WCS auctions that will allow companies a meaningful opportunity to participate. In addition, DigiVox proposes that the Commission decline to impose build out requirements upon WCS auction winners. DigiVox also proposes that the Commission provide small business bidding credits in all spectrum blocks. Finally, DigiVox proposes that the Commission implement the CMRS spectrum cap in awarding WCS spectrum and limit to 98 the total number of CMRS licenses for which any party may take advantage of small business bidding credits and other designated entity benefits.

In the comments below, DigiVox elaborates upon its rationale for proposing the above measures.

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To: The Commission

COMMENTS OF DIGIVOX CORPORATION

DigiVox Corporation ("DigiVox"), by its attorneys, hereby submits its comments on the Notice of Proposed Rulemaking in GN Docket No. 96-228 regarding the Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service that was released by the Federal Communications Commission (the "Commission") on November 12, 1996.

Background

In 1996, Congress passed the Omnibus Consolidated Appropriations Act (the "Appropriations Act"), which, among other things, required the Commission to reallocate the frequencies at 2305-2320 and 2345-2360 MHz to wireless services in a manner consistent with international agreements concerning spectrum allocations, and to assign the use of such frequencies by competitive bidding pursuant to Section 309(j) of the Communications Act of 1934, as amended (the "Communications Act"). The Appropriations Act requires that the Commission commence the competitive bidding process for these frequencies in a manner that ensures that all proceeds of the bidding are deposited in accordance with Section 309(j)(8) of the

Communications Act, not later than September 30, 1997. In order to make this spectrum available for licensing quickly, the Appropriations Act granted the Commission permission to use expedited administrative procedures.

The Appropriations Act further provided that 5 U.S.C. Chapter 6 and 44 §§ 3507 and 3512 would not apply to the rules and competitive bidding procedures governing the frequencies at issue here. The statute also provided that the Commission could grant a license application for these frequencies after seven days following issuance of a public notice of the acceptance for filing of the long form application or major amendment thereto, notwithstanding the 30-day public notice provisions of 47 U.S.C. § 309(b). Finally, the statute provided that the Commission could specify a period that is not less than five days following issuance of such public notice for the filing of petitions to deny a license application for these frequencies, notwithstanding the 30-day public notice provisions of 47 U.S.C. § 309(d)(1).

By a Notice of Proposed Rulemaking ("NPRM"), released November 12, 1996, the Commission proposed certain measures to implement the Congressional mandate. The Commission proposed to establish a new Wireless Communications Service ("WCS") in the 2305-2320 and 2345-2360 MHz bands. The Commission also proposed to award one or more WCS licenses by competitive bidding using multiple round electronic auction procedures, and it further proposed to permit the WCS licensee to provide any fixed, mobile, radiolocation services or satellite Digital Audio Radio Services, consistent with the international Radio Regulations. The Commission also proposed to establish service and technical rules to prevent harmful interference to other radio services. Finally, the Commission sought comment on each of its proposals.

Discussion

I. The Commission Should Allocate the 2305-2320 and 2345-2360 MHz Bands of Spectrum by Providing 10 MHz to Each WCS Licensee in Paired Blocks of 5 MHz.

The Commission should award 10 MHz to each successful bidder in paired blocks of 5 MHz as follows:

2305-2310 MHz paired with 2345-2350 MHz
2310-2315 MHz paired with 2350-2355 MHz
2315-2320 MHz paired with 2355-2360 MHz

10 MHz is the minimum amount of spectrum required to allow WCS operators to compete effectively. Many technologies for which the WCS spectrum could be used require at least 10 MHz of spectrum to operate. Services employing such technologies provide a promising source of competition to the wireline based local exchange services that to date have gone largely unchallenged by other services that were expected to provide competition to the local loops.

The 10 MHz spectrum could be utilized most efficiently and beneficially by dividing the allocation into paired blocks of 5 MHz each for base and customer unit connections.[1/] Such a coupling would foster the development and application of new competitive services, including those based on "low tier" technologies, such as Personal Access Communications System ("PACS"), which will provide real competition to the local loops and whose technology requires such a coupling.

PACS technology as well as some other "low tier" technologies require the pairing of two 5 MHz blocks with adequate separation (in this case 40 MHz) between base and customer unit to avoid harmful interference that would prevent full duplex operation. Ten MHz is the minimum

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1/ *See* letters from Hughes Network Systems (Exhibit 1), BellCore (Exhibit 2), Siemons Stromberg-Carlson (Exhibit 3) and statement of TSA Sites, Inc. (Exhibit 4) in which these companies explain the need for having two 5 MHz paired blocks.

amount of spectrum required for PACS and other "low tier" technologies to have sufficient channels for appropriate frequency reuse without causing intrasystem interference.[2/]

II. The Commission Should License WCS Spectrum Based on the MTA License Service Area.

The Commission should make use the 51 Major Trading Areas ("MTAs"), as defined for the narrowband and broadband Personal Communications Service ("PCS"), as the licensed service areas for the WCS spectrum.[3/] This licensing area is the only proposed license service area that would provide for the effective participation of small businesses in the provision of WCS services. Many small businesses do not have the resources to provide service on a national, or even regional, basis and would thus be precluded from participating in an auction of WCS spectrum on a geographical basis larger than the MTA. As a result, a licensing area any larger than the MTA would prevent the participation of small businesses in the provision of wireless service in the WCS spectrum contrary to the public interest and to Congress' dictate,

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2/ *See* report of economist Ronald M. Harstad, Ph. D. (Exhibit 5), in which Dr. Harstad explains that pairing the frequencies for bidding purposes results in a more efficient auction.

3/ In licensing PCS spectrum, the Commission employed an MTA service area based upon the definition provided by Rand McNally & Company ("Rand McNally"), which divides the 50 states and the District of Columbia into 47 MTAs. *See* Rand McNally 1992 Commercial Atlas & Marketing Guide at pages 38-39 (123rd edition). The Commission separated Alaska from the Seattle MTA, treating Alaska as a separate MTA-like area. In addition, the Commission has treated the following areas as separate MTA-like areas: (1) Puerto Rico and the United States Virgin Islands; (2) Guam and the Northern Mariana Islands; and (3) American Samoa. DigiVox proposes the adoption of this version of the MTA license service area.

found in Section 309(j) of the Communications Act, which requires the Commission to make spectrum opportunities available to small businesses, women and members of minority groups.[4/]

The use of the smaller MTA license areas, together with the licensing of 10 MHz blocks of spectrum, will not hinder the Commission's speedy licensing of WCS spectrum and collection of bidding proceeds as required by Congress in the Appropriations Act. These measures will result in a total of 153 WCS licenses to be auctioned, which is of the same order of magnitude as the number of licenses that were auctioned in the A and B Block PCS auctions that were completed in three months. Since the time of the auctions of A and B Block PCS spectrum, which were among the first spectrum auctions conducted by the Commission, the Commission has conducted two significantly more complex spectrum auctions, through which the Commission has improved and refined its auctioning capabilities. As a result, the Commission is now fully capable of conducting an auction for 153 spectrum licenses in a two month auction period. In addition, there are likely to be fewer than 153 entries to license since some companies will probably win multiple licenses.

The Commission could take measures that would effectively speed the auction process, thereby facilitating the timely distribution of WCS spectrum licenses. First, as proposed in the NPRM, the Commission could establish minimum bids, which would speed up the auction by assuring that only parties that are serious about aquiring WCS spectrum participate in the auction, thereby preventing other parties from consuming the limited amount of time that Congress has afforded for the auction of WCS spectrum. Second, the Commission could employ higher bidding increments in early stages of the auction, reducing the increments only when bidding begins to slow down. Third, the Commission could increase the number of rounds per

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4/ Over 99 percent of women and minority owned businesses are small businesses.

day of the auctions sooner than was done in previous spectrum auctions. Finally, if the Commission deems it necessary, the Commission could use the methodology for ending the auction as proposed by Dr. Harstad.[5/]

III. The Commission Should Adopt the Following Auction Schedule.

In order to effectively compete in the auctions, many parties, especially small businesses, which are uniquely poised to bring diversity to the marketplace, will need 90 days from the time of release of the final rules until FCC Forms 175 are due. They will need the first 30 days to finalize their business plans, which many parties have begun to craft since the release of the Commission's NPRM. Although these parties are already working on their business plans, their plans cannot be completed until the Commission sets the final rules. Once business plans have been completed, parties need days days to have their potential financial backers approve and pool funding. Under the following proposed auction schedule, a mid January release of the final WCS aution rules would allow interested parties the 90 days that they need to finalize business plans and obtain financing:

Mid-January 1997	Release of final auction rules
Late January, 1997	Publication of rules in Federal Register
April 15, 1997	Submission of FCC Forms 175
April 29, 1997	Upfront payments due
May 2, 1997 (afternoon)	Commencement of bidding
July 15, 1997	Projected completion of auction
July 25, 1997	Submission of FCC Forms 600
August 15, 1997	Public Notice of tentative selectees
August 22, 1997	Petitions to Deny due
August 27, 1997	Reply pleadings due
September 19, 1997	Grant of licenses
September 30, 1997	Final payments due

5/ *See* the Harstad report (Exhibit 5) for a more detailed proposal on how to speed up the auction process.

This proposed schedule strikes a delicate balance between meeting the Congressional deadlines and maximizing competition and diversity in the auction process by providing for participation by a greater number of parties that are interested in providing WCS service, but who need adequate time to firm up the necessary financing. The Commission should learn from the F Block auctions where the short preparation time afforded to parties effectively precluded many small businesses, including DigiVox, from participating in those auctions. As a result of the failure to provide such businesses a reasonable amount of time to obtain financing, relatively fewer small businesses have been allowed to participate in the provision of services in the spectrum that was auctioned. Thus, the Commission was unable to honor its obligation under Section 309(j) of the Communications Act to provide an opportunity to small businesses, women and members of minority groups to effectively participate in the spectrum auctions.

It is the Commission's legislative duty to ensure that such a denial of opportunity to small businesses in the allocation of spectrum is not repeated. The schedule herein proposed, together with the adoption of the measures discussed in the preceding section, provides the means by which the Commission could provide parties the time necessary to allow them to participate in the WCS auction while meeting Congress' deadlines.

IV. The Commission Should Not Implement Build Out Requirements for WCS Spectrum Winners.

The Commission should decline to adopt build out requirements for successful bidders in the WCS auction as proposed in the NPRM for the reasons suggested therein. Such requirements would prevent the beneficial use of WCS spectrum by services, such as PACS and other innovative low-tier services, which are uniquely poised to provide a viable source of competition

to wireline local exchange services and whose physical infrastructure deployment to cover geographic area will require relatively longer periods of time to build out than will other service providers.

V. The Commission Should Provide for Small Business Bidding Credits in All Spectrum Blocks.

The Commission should adopt small business bidding credits available for all WCS spectrum blocks so that small businesses will not be precluded from participating in the provision of service in these blocks. By adopting bidding credits in all spectrum blocks, the Commission will render small businesses more likely to succeed in the auctions and to compete for the provision of a greater variety of wireless services. To the contrary, if the Commission provides bidding credits in only one spectrum block, small businesses will be less likely to succeed in winning any WCS spectrum.

Further, because installment payment plans will not be available in the WCS auction, the Commission should make available to small businesses greater discounts than were offered small businesses in the Commission's F Block PCS auctions. Specifically, the Commission should provide 25% and 40% discounts, respectively, to small businesses and very small businesses, as defined in Section 24.720(b) of the Commission's Rules. Because small businesses will be bidding against multibillion dollar companies who have a much lower cost of capital, the larger discounts are necessary to provide small businesses an opportunity to win in some markets. Large companies will still be able to win markets; however, they should be required to pay a higher price, which they can afford because of their low cost of capital.[6/]

[6/] *See* the Harstad report (Attachment 5) for an economic analysis of the need for small

(continued...)

In addition, a 5% bidding credit should be awarded to small business bidders that do not hold the license to any Commercial Mobile Radio Service ("CMRS") spectrum in the MTA for which it is bidding. In assessing whether bidders hold an attributable interest in CMRS spectrum in a particular MTA, the Commission should use the same definition of significant overlap that is used with regard to PCS technology.[7/] Providing a discount to small businesses without CMRS spectrum in the market will foster competition and diversity of licensees as required by Section 309(j) of the Communications Act.

VI. The Commission Should Implement the CMRS Spectrum Cap in Awarding WCS Spectrum.

The Commission should apply the 45 MHz CMRS spectrum cap in determining eligibility for participation in the WCS auctions,[8/] and it should amend Section 20.6 of its rules to

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6/ (...continued)
business discounts and their resulting benefits to competition.

7/ Section 20.6(c) of the Commission's Rule provides that significant overlap occurs when at least 10 percent of the population of the PCS licensed service area, as defined by the 1990 census figures for the counties contained therein is within the CGSA(s) and/or SMR service area(s). The rule further provides that the Commission shall presume that an SMR service area covers less than 10 percent of the population of a PCS service area if none of the base stations of the SMR licensee is located within the PCS service area. For an SMR licensee's base stations that are located within a PCS service area, the channels licensed at those sites will be presumed to cover 10 percent of the population of the PCS service area, unless the licensee shows that its protected service contour for all of its base stations covers less than 10 percent of the population of the PCS service area.

8/ The spectrum cap currently provides that "[n]o licensee in the broadband PCS, Cellular, or SMR services (including all parties under common control) regulated as CMRS shall have an attributable interest in a total of more than 45 megahertz of licensed broadband PCS, cellular and SMR spectrum regulated as CMRS with significant overlap in geographic area." *See* 47 C.F.R. § 20.6(a).

include WCS spectrum along with PCS, cellular and Specialized Mobile Radio ("SMR") spectrum in determining whether parties have reached the 45 MHz limit.

Allowing parties to hold an attributable interest in more that 45 MHz of CMRS spectrum would inhibit competition in the market and unduly concentrate CMRS spectrum in the hands of a few entites, contrary to the legislative mandate found in Section 309(j) of the Communications Act.[9/]

VII. The Commission Should Limit to 98 the Total Number CMRS Licenses for Which Any Party May Take Advantage of Small Business Bidding Credits and Other Designated Entity Benefits.

Finally, the Commission should limit to 98 the total number CMRS licenses for which any entity may take advantage of small business bidding credits and other designated entity benefits. This limit promotes the objective intended by § 309(j) of the Communications Act to prevent the conglomeration of too many licenses in any one entity. Once a party has received 98 CMRS licenses, it no longer needs the special benefits afforded to small start up enterprises. Instead, these benefits should go to other new entrants who have not yet had an opportunity to take advantage of such benefits. In short, the limitations adopted in Section 24.710 of the Commission's Rules should be expanded to include WCS licenses, thereby promoting the diversity of licenses mandated by Section 309(j) of the Communications Act.

9/ *See* the Appendix to the Harstad report for a detailed analysis of the need to include WCS in the 45 MHz spectrum cap.

Conclusion

Accordingly, DigiVox Corporation respectfully urges the Commission to adopt its proprosals and expeditiously conduct lotteries for the WCS licenses identified in its November 12, 1996 Notice of Proposed Rulemaking.

Respectfully submitted,

DIGIVOX CORPORATION

By: _____
Eliot J. Greenwald
Colette M. Capretz
Its Attorneys

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Dated: December 4, 1996

EXHIBIT 1

HUGHES
NETWORK SYSTEMS
A HUGHES ELECTRONICS COMPANY

Wednesday, November 27, 1996

John Prawat
President and CEO
DigiVox Corporation
P.O. Box 65094
Washington, DC 20035

Dear John,

As a manufacturer, Hughes Network Systems (HNS) supports the allocation of the 2305-2320 MHz and 2345-2360 MHz bands for wireless services. Specifically, HNS would be interested in supplying equipment for use in this band compliant to the PACS standard (JTC-STD-014), as modified for the new band. HNS believes that with some modifications, the existing PACS system would be able to be used in the proposed band. In order to ensure that PACS could operate successfully in this new band, it is imperative that the allocations be a minimum of 5 + 5 MHz paired channels, in an FDD format. Further, the FCC should leave it to industry to develop (or use existing) standards.

Please feel free to contact me if I can be of further assistance; my phone number is 301.548.1251.

Sincerely Yours,

Vinay Patel

Vinay Patel
Marketing Director
Wireless Networks Business Unit

11717 Exploration Lane, Germantown, Maryland 20876 USA
Phone: 301-548-1251, Fax: 301-548-1245, E-Mail: VPATEL@HNS.COM

EXHIBIT 2

Bellcore
Bell Communications Research

November 25, 1996

Mr. J. Prawat
DigiVox Corporation
1250 24th Street, N.W.
Suite 350
Washington, D.C.20037

Dear John:

As we discussed, given that the conditions described below are satisfied the Personal Access Communications System (PACS) could be modified to operate in the 2305-2320 and 2345-2360 MHz bands. The conditions required are:

- the spectrum is allocated in frequency pairs with a like amount of spectrum in each of the two bands. (This condition is needed to permit Frequency Division Duplex operation.)
- a minimum of 10 MHz of spectrum is acquired. (PACS requires a minimum of 5MHz in each band in order to provide the highest quality service.)
- the FCC rules do not specify specific radio system parameters that preclude the use of PACS. (The FCC left technology choice in the PCS band to the license winners.)

The only substantive modification required to up-band PACS to the 2.3 GHz band is changes to the physical level to account for the 40 MHz split between the forward and reverse channels. The main impact would be in the handset. Roughly, we estimate the change to add about 10% to the cost of the handset.

Please give me a call at 908 758-2208 if I can be of further assistance.

Sincerely,

Howard Sherry
Chief Scientist / Director
Wide Area Wireless Systems Research

EXHIBIT 3

SIEMENS
Stromberg-Carlson

December 4, 1996

John Prawat
President and CEO
DigiVox Corporation
1250 24th Street N.W., Suite 350
Washington, D.C. 20037

Dear John,

I am delighted to summarize the results of our conversations over the last 2 weeks on Siemens Stromberg-Carlson's support for the proposed FCC allocation of 2305-2320 and 2345-2360 MHz bands for "Wireless Communications Services" (WCS). Siemens Stromberg-Carlson supports the FCC's initiative to make this spectrum available for a broad range of fixed and mobile wireless services.

Specifically, our interest has centered on a possible PACS Edge™ turnkey products and services offering in this band. In addition to some modifications required by the new frequencies of operation, our investigation has identified two important conditions for operation or a PACS Edge™ in the proposed WCS band: 1) paired frequencies separated by 40MHz, and 2) allocations of at least 10 MHz of spectrum.

I look forward to subsequent dialogue between our companies to assess opportunities for turnkey PACS Edge™ products and services. If you have any questions or need further assistance, don't hesitate to give me a call at (561)955-8001.

John Tebes
Director PACS Edge™
Wireless Business Unit

Siemens Stromberg-Carlson

900 Broken Sound Parkway Boca Raton, Florida 33487 (407) 955-5000

EXHIBIT 4

TSA SITES, INC.

Third Floor
2201 Wilson Blvd
Arlington, VA 22201
(703)807-0000 (703)807-1900 fax 104174.654@COMPUSERVE.COM
(888)854-SITE Fax-On-Demand for Tower Registration

STATEMENT OF TSA SITES, INC.

TSA SITES,INC., on behalf of **DigiVox Corporation**. files the following comments on the FCC's NPRM (released November 12, 1996, FCC 96-441) for the Establishment of Part 27 of the FCC Rules.

Background

The Commission has repeatedly advocated in its decisions since the late 1980's for the advancement of new and innovative technologies. TSA concurs that the proliferation of new technologies is sound policy from a number of standpoints. The Commission has repeatedly made similar statements concerning the advancement of new entrants into the wireless industry.

On the first point the Commission has somewhat succeeded in implementing new technologies. On the second point, the Commission has fallen short of the mark. DigiVox and other potential wireless players represent new blood to the industry and should be encouraged to participate in the auction.

Unlike past allocations, this is the first instance where an allocation is made available to two industries, the mobile services and satellite industries. Any satellite usage of the spectrum will likely be one-way service. If the Commission were to allocate one 15 Mhz block for satellite usage, the other 15 Mhz of spectrum would preclude the use of paired channel blocks. TSA strongly urges the reallocation be changed to include conventional paired channel blocks.

In particular, TSA urges the Commission to craft Part 27 rules to permit the use of paired channels, thus making possible large scale economies for low-tier micro-cellular technologies. In particular, TSA advocates the use of **Personnal Access Communications Systems (PACS)** technology. PACS has practical advantages other than technology, as cited below.

At this point in the evolution of the wireless industry, it is clear the TDMA, GSM and CDMA have a future in the United States. What has not been implemented on a wide scale is a commercially viable low-tier microsite technology such as PACS which is capable of offering meaningful competition to the local telephone monopoly.

Effective Terrestrial Usage Requires Channel Pairing

Many services require two-way transmission of information. Two methods are generally considered for duplexing: **Frequency Division Duplexing (FDD)**, in which the information flowing in each direction is transmitted on a different frequency, and **Time Division Duplexing (TDD)**, in which the information in transmitted on the same frequency, but with the channel rapidly alternating between the two directions of transmission.

Use of **FDD** will require that the spectrum be allocated in paired blocks. **FDD** provides a number of advantages compared with **TDD** for many two-way services resulting in reduced cost of infrastructure to the service provider. Some of the underlying factors include:

(a) **TDD** doubles the required radio transmission rate, making **TDD** more susceptible to inter-symbol interference than **FDD,**
(b) delay consideration make **TDD** less suitable for large cell radii
(c) **TDD** is more sensitive to a lack of synchronization between base stations / radio ports of a network resulting in loss of capacity if potentially costly measures are not taken to provide external synchronization.

The existing breakdown of the reallocation into two 15 Mhz blocks separated by 40 Mhz (2305 - 2320 Mhz and 2345 - 2360 Mhz), lends itself to channel pairing. Channel pairing does not preclude satellite services from utilizing a split spectrum allocation scheme.

In order to effectively utilize a portion of the spectrum for terrestrial based land mobile services, the Commission must award the spectrum with channel pairs. Without the provision for channel pairs, a prospective auction bidder may not be able to make a business case for the spectrum if the market and service to be implemented are terrestrial based.

Site Deployment: The Public Convenience

TSA believes that it is in the best interest of wireless providers to have a readily available mode of technology which can relieve the strain conventional macrosite deployment campaigns are creating nationwide. The FAA and local municipal governments currently are pressured by the large number of network deployment efforts underway.

TSA and other site companies are experiencing tremendous opposition to the deployment of conventional macro sites. In fact, local governments are adjusting their fee schedules to meet the processing requirements created by the proliferation of macro site deployment. The increased fees and bottleneck of paper work could be alleviated by advancing the economies for PACS and other low-tier technologies.

TSA believes crafting the Part 27 rules to permit the use of new and innovative technology such as low-tier microsite deployment will advance the public interest, reduce the FAA site requests and mitigate the public outcry conventional macrosite deployment efforts bring to the public forum.

Gregory B. Daly
TSA SITES, INC.

EXHIBIT 5

Report of Ronald M. Harstad, Ph.D., on WCS Auctions

Summary of Arguments

My initial concern in this brief is with the meaning of an efficient outcome of the 2.3 GHz WCS auction. In sum, part I makes the following points.

1. Awarding each license to the bidder who is willing to pay the most is not an acceptable approximation for efficiency in the WCS auction.

2. A WCS license winner entering the CMRS market contributes little to the competitiveness of that market, and may make no contribution to efficiency.

3. LECs have great market power in local exchange markets. The burgeoning "one-stop shopper" entry into local exchange via reselling the LEC's local loop will do little to reduce the LEC's market power.

4. In contrast, there is a dramatic social gain from the increased competitiveness that results in a local exchange market for entry by a firm using a low-tier microcellular technology, such as PACS, which will not resell both origination and termination on any call.

5. The most strikingly adverse outcome of the WCS auction would be for CMRS incumbents to win licenses for the primary purpose of warehousing them, to prevent entry. This is contrary to 3 of 4 congressional objectives.

6. Acquisition of spectrum in excess of effective capacity is evidence of warehousing intent. This clearly arises somewhere before 45 MHz.

7. Less competitive CMRS markets will yield prices further above efficient levels. Hence, warehousing is prima facie evidence of unjust enrichment.

8. A CMRS and/or LEC incumbent should be presumed to be willing to pay more for a WCS license than its value to a WCS and/or LEC entrant.

9. Ensuring that new and innovative technologies are readily accessible and reaching an efficient outcome are compatible goals.

10. Efficiency calculations must involve broader considerations than simply the value-in-use of the radio spectrum segment.

11. Revenue received from licenses has an important efficiency component, since tax rates would otherwise be higher, and hence would distort economic behavior, with measurable inefficiencies resulting.

12. The belief that small firms will be inefficient spectrum users is based on the assumption that they will enter the same markets as CMRS incumbents, imitating the same technologies. This is clearly not true for many prospective bidders for WCS licenses.

13. The efficiency gains that result when subsidizing small firms with bidding credits forces larger competitors to bid more aggressively can outweigh negative consequences of small bidders' inefficiencies (if any).

14. The Regional Narrowband auctions clearly show subsidized bidders causing first-line bidders to pay more for their licenses won the extra revenue thus generated more than covered the cost of subsidies.

15. Research indicates that this should be a general, robust phenomenon. Efficiency is enhanced by subsidizing less-efficient bidders. The added revenue from unsubsidized bidders